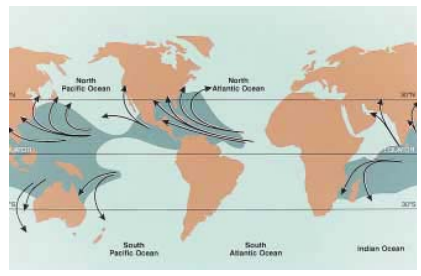
Fall 2008 Edition

Natural Gas TODAY

For Municipal Gas Systems

To learn how a hurricane is formed, see page 3A.



Inside This Issue…

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New DIMP Regulations Promote Risk Analysis

This article written by Glen Armstrong and Jenny Hudson, P.E., first appeared in the Fall 2008 issue of the American Public Gas Magazine, THE SOURCE.

Over the past three years, the American Public Gas Association (APGA) has helped develop guidelines for the integrity management of nearly 2 million miles of gas distribution piping in the United States. The goal: improving public safety, while intelligently minimizing the potentially prohibitive expense and complexity that new regulations could have on APGA membership and the public gas industry.

The guidelines - the Distribution Integrity Management Program (DIMP) rules - are expected to be issued this summer. Issued by the U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA), the DIMP regulations follow those established by the same authority in 2001 for liquid pipelines and in 2004 for natural gas transmission pipelines. However, the DIMP regulations are far less prescriptive and have much greater flexibility for natural gas distribution operators than the regulations affecting the transmission segment.

The very flexibility of implementation - while certainly welcome - may pose problems for APGA members in terms of interpretation, because regulatory oversight and enforcement varies from state to state. The manner in which these rules will be enforced is probably what concerns operators the most. Although the DIMP regulations are set at the federal level, it is up to the state regulators to audit the local operators' DIMP programs. Every system audit will be different. For example, the regulators in Arizona may be looking for very different things than those in Illinois.

Operators of gas and liquid transmission pipelines have faced fines - large fines in some cases - for failures of implementation. Such fines are not anticipated with the DIMP rules, at least not at the outset. It is safe to assume that the rules will be enforced, as regulators themselves normally define the reporting requirements and time frames. Although the specifics of regulatory enforcement of DIMP are yet to be determined, there is no question that failing to comply with DIMP will have its consequences. Of particular concern is the consequence of how and where local resources are directed.

Start with risk analysis

At the very minimum, every operator must understand the DIMP rules, write a program and do a risk analysis - a big issue for operators. Performing the risk analysis will help operators prioritize and devote attention to their highest areas of risk. It is anticipated that most operators will use a combination of internal and external subject matter experts and mathematical models to asses and prioritize their risk.

While the term "subject matter experts" can appear daunting, it really refers to those individuals most familiar with the operation and maintenance of this system - your

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REX-East Pipeline Construction Underway

As natural gas demand increases in the United States, one of the largest natural gas pipelines ever built in North America is under construction with a target full-service date for the summer of 2009.

Known as the Rockies Express Pipeline (REX), the 1,679-mile, $5.6 billion pipeline will have a capacity of approximately 1.8 billion cubic feet of natural gas per day.

In May, the 713-mile REX-West portion of the project stretching from Weld County, Colorado to Audrain County, Missouri was completed and is fully in service. This summer, construction began on the eastern portion of the pipeline, known as REX-East, which originates in Audrain County and will end in Monroe County, Ohio. It will consist of 638 miles of 42-inch diameter pipe and will cross the states of Missouri, Illinois, Indiana and Ohio.

"The Rockies Express Pipeline project is a significant investment in the U.S. energy infrastructure and will help meet the nation's growing need for reliable domestic supplies of energy," said Allen Fore, public affairs manager for REX. "REX will bring natural gas from the Rocky Mountain region, where gas is plentiful, to communities in the Midwest and points east."

This story is continued on the next page.

The economic benefits from REX have already been felt by local communities across the pipeline route. The project brings increased tax revenue to local governments and provides thousands of jobs for local residents. In fact, it is estimated that the total project will utilize more than 5 million man hours of work for pipeline construction. Additionally, the project has brought increased revenue to local restaurants, hotels and retailers from patronage by construction crews.

From day one, REX has taken great strides to minimize environmental and landowner impacts during construction. For instance, REX has utilized environmental inspectors throughout construction to ensure compliance with all necessary permits. Best management practices throughout construction have also been implemented which include topsoil segregation and replacement, temporary and permanent erosion control and rights-of-way restoration.

Safety remains a top priority for REX and all contractors responsible for construction. At each step in the construction process, extra care has been taken to ensure the safety of employees, landowners, and contractors. The pipe is coated with special compounds to minimize corrosion and every weld is inspected by experts. The pipeline is buried with adequate ground cover and identified with above ground markers, pursuant to Department of Transportation regulations.

Additionally, REX uses cathodic protection measures on all surfaces to further protect against corrosion. Once complete, each section of pipeline is tested at a higher pressure than the proposed operation pressure before putting it into service. If repair is necessary during operation, shut-off valves are installed at each section of the pipeline which stops the flow of natural gas.

"Department of Transportation statistics demonstrate that pipelines are the safest form of energy transportation. REX is committed to public safety, protection of the environment and operating its facilities in compliance with all applicable rules and regulations," Fore said.

Natural gas supplies 25 percent of all the energy consumed by Americans and the U.S. Energy Information Administration projects that consumption of natural gas will increase by over 20 percent between now and 2030. REX is needed to meet this growing demand and ensure that we are meeting America's growing energy needs.

Natural Gas Crossword Answers:

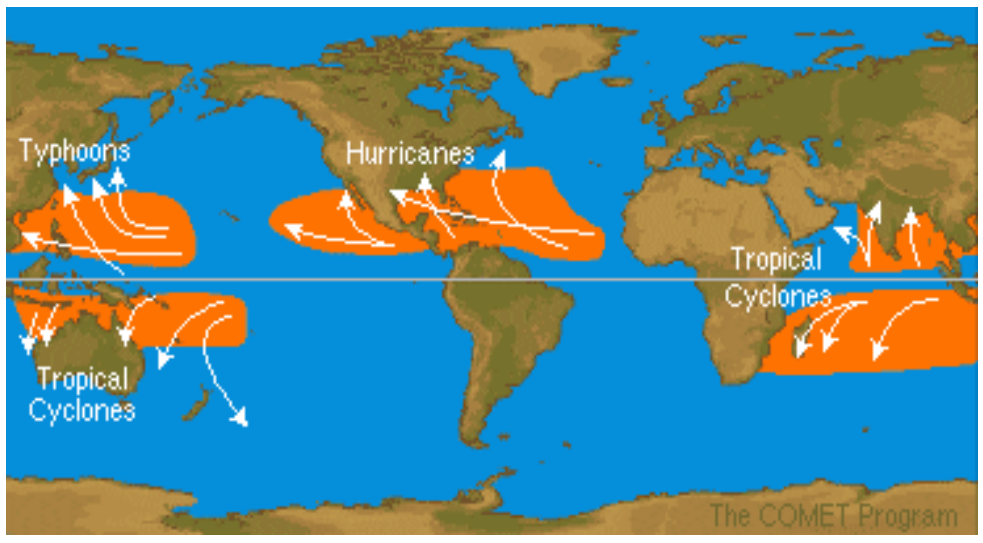
ACROSS

3. Nonrenewable
4. Sun
5. Methane
6. Meter
8. Mercaptan
10. Pipelines
11. Utility
13. Chemical
14. Homes
15. Fossil Fuel

DOWN

1. Industry
2. Underground
7. Landfill
9. Heat
12. Texas
13. Coal

How Hurricanes Form



Breeding Grounds

Hurricanes are products of a tropical ocean and a warm, moist atmosphere. Powered by heat from the sea, they are typically steered by the surrounding deep layer (from the ocean's surface to 8 miles up) easterly winds, generally south of 25 degrees north latitude and by high-level westerly winds north of 25 degrees north latitude.

The Atlantic hurricane season starts on June 1. For the United States, the peak hurricane threat exists from mid-August to late October, although the official hurricane season extends through November 30. Over other parts of the world, such as the western North Pacific, typhoons can occur year-round.

Storm Structure

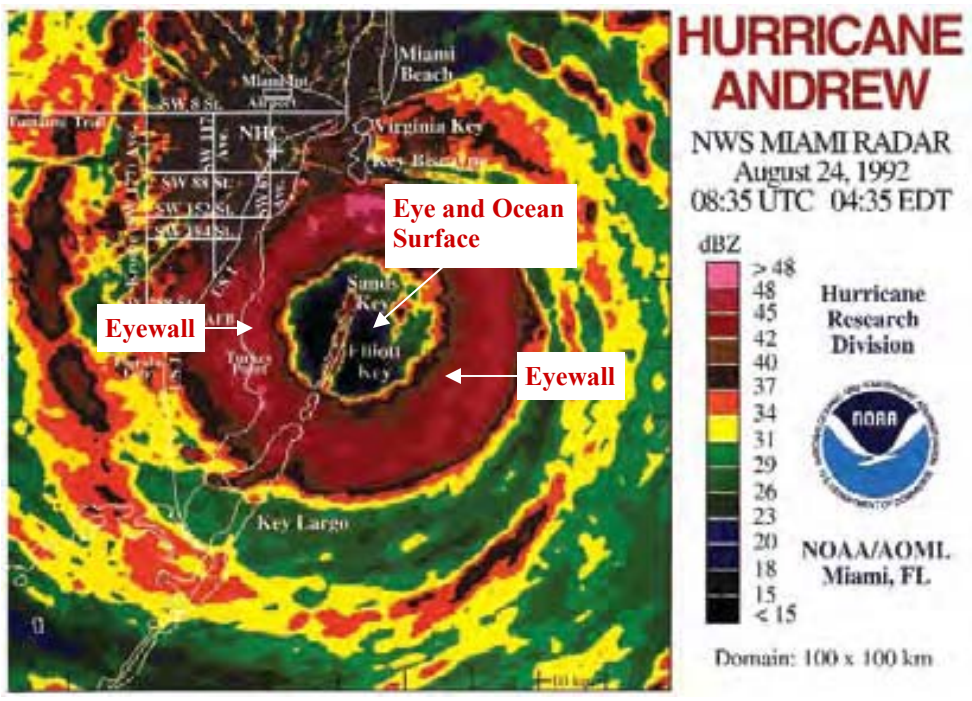
There are three conditions required for a disturbance to form and strengthen into a hurricane. First, the disturbance must gather heat and energy through contact with warm ocean waters. Next, added moisture evaporated from the sea surface then powers the seedling tropical storm like a giant heat engine. Finally, the seedling storm forms a wind pattern near the ocean surface that spirals air inward. Bands of thunderstorms form, allowing the air to warm further and rise higher into the atmosphere. If the winds at these higher levels are relatively light, this structure can remain intact and further strengthen the hurricane.

The center, or eye, of a hurricane is relatively calm with sinking air, light winds and few clouds. The most violent winds and rain take place in the eyewall, the ring of thunderstorms immediately surrounding the eye. At the top of the eyewall (about 50,000 feet), most of the air is propelled outward, increasing the air's upward motion. Some of the air, however, moves inward and sinks into the eye, creating a cloud-free area.

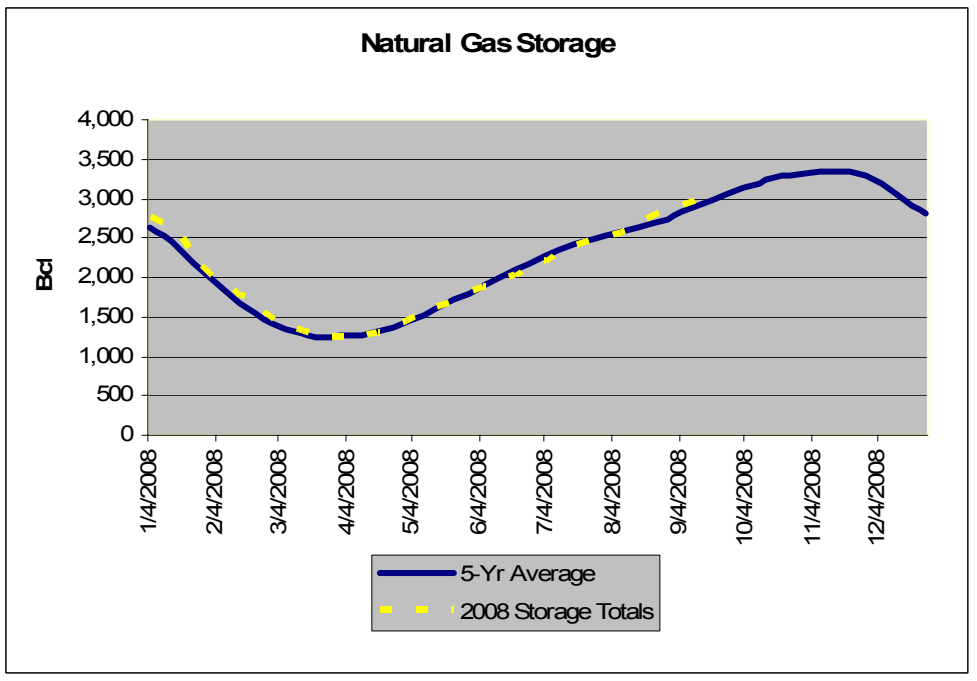
Coastal Areas and Barrier Islands

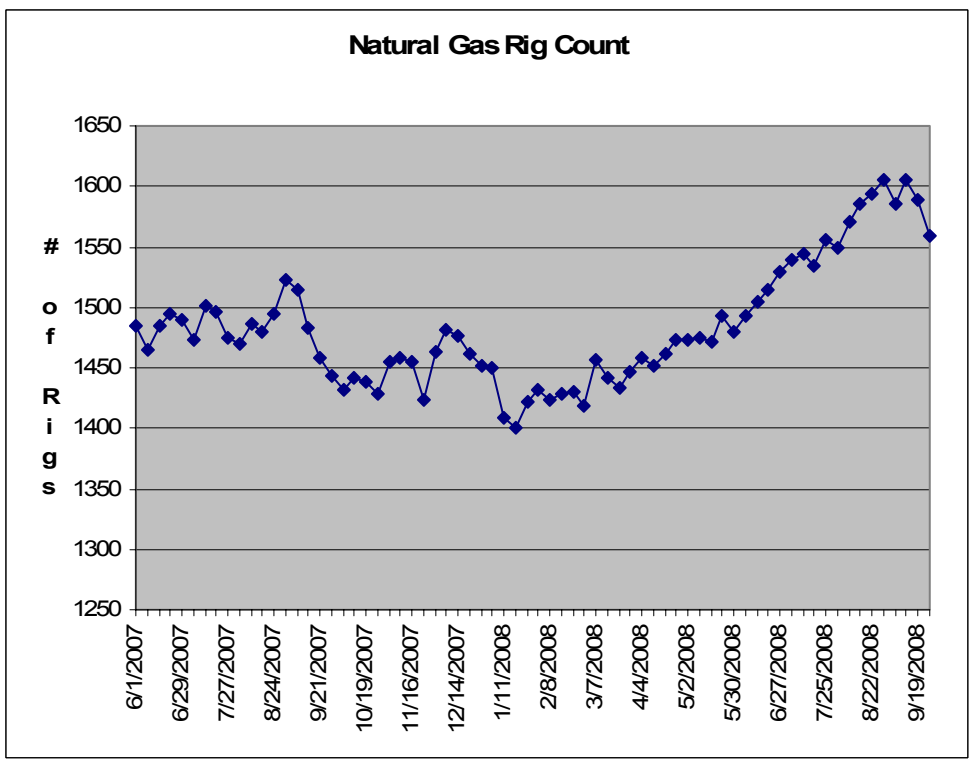
All Atlantic and Gulf coastal areas as well as the U.S. Pacific Islands are subject to hurricanes/typhoons or tropical storms. Although rarely struck by hurricanes, parts of the southwest United States and Pacific Coast can experience heavy rains and floods from the remnants of hurricanes spawned off Mexico. Hawaii and the U.S. territories, such as Guam, American Samoa and Puerto Rico, are also subject to hurricanes. Hurricane Iniki struck Kauai, Hawaii, on September 11, 1992, resulting in $2.5 billion in damage. During 1992, Guam was battered by five typoons. On December 16, 1997, Guam was hit by Super Typhoon Paka, causing over $520 million in damage.

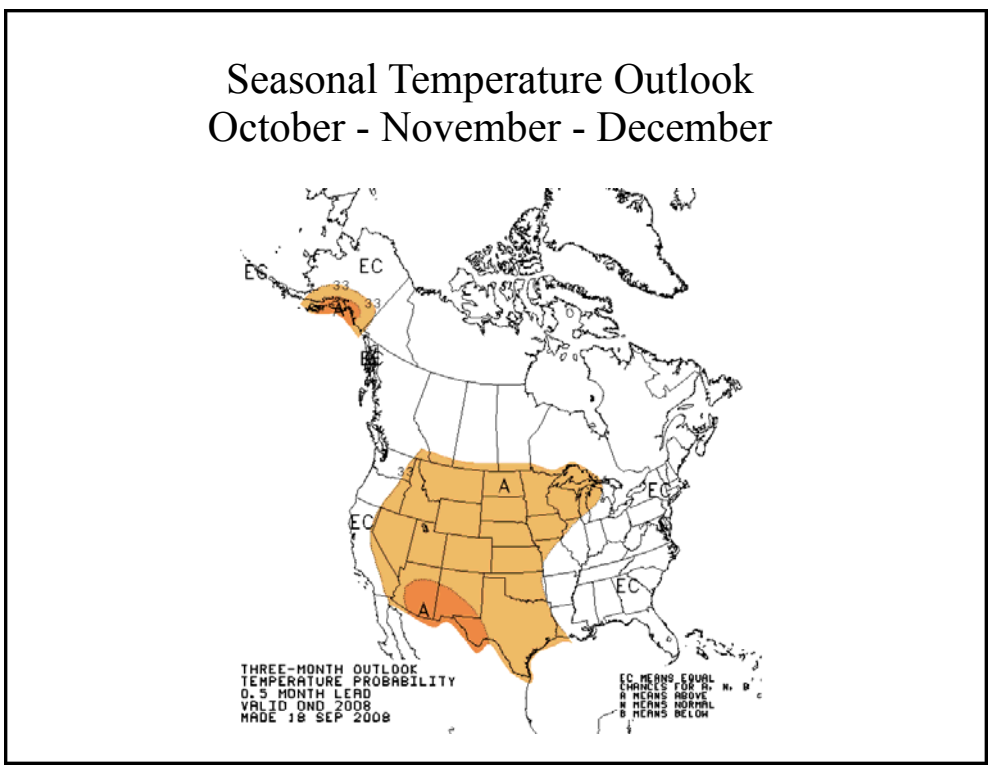
Due to the limited number of evacuation routes, barrier islands such as the Outer Banks of North Carolina and areas like the Florida Keys and New Orleans, Louisiana, are especially vulnerable to hurricanes. People living near coastal areas may be asked by local officials to evacuate well in advance of a hurricane landfall.

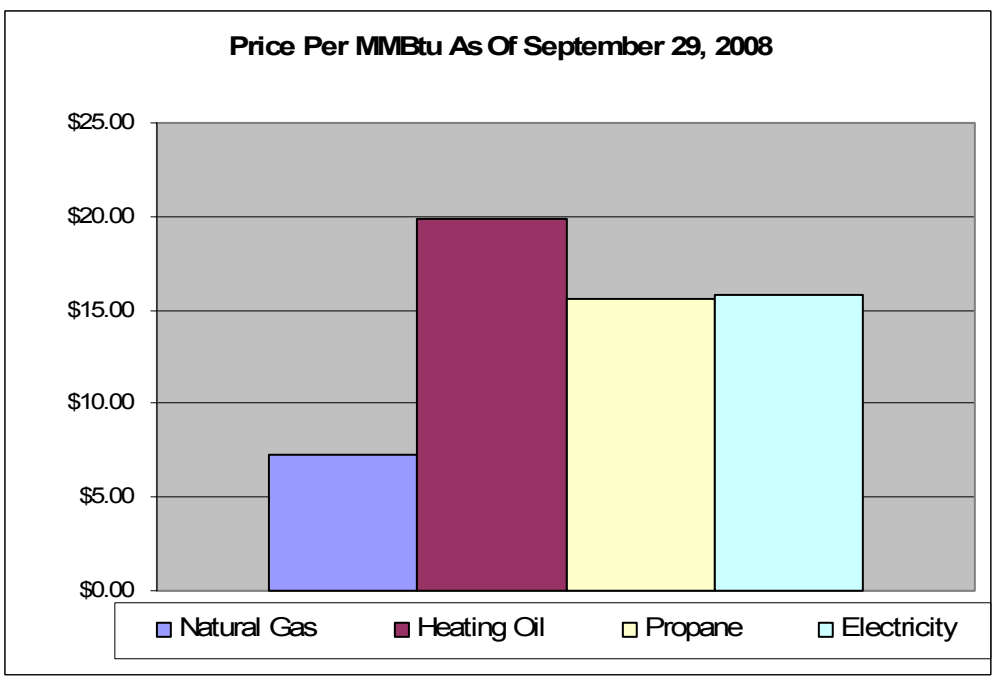


Snapshots









New DIMP Regulations

From Page 1A

maintenance staff.

To assist smaller gas systems in developing programs that comply with DIMP, the APGA board of directors is developing a software program through the APGA Security and Integrity Foundation. The program (internally referred to as "SHRIMP" for Simple, Handy, Risk-based Integrity Management Plan) now in a beta format, is expected to be available by the end of 2008 and can be used to complement internal expertise and outside consultants on developing compliant plans and analysis.

Different Integrity Management Approach for Distribution Piping

In the regulations for gas transmission pipelines, operators were required to identify high consequence areas where population density could result in greater possibility of damage and injury and then to devote attention to the highest risk areas. This required periodic inspections of pipelines for corrosion and other defects. A different approach to integrity management is necessary for gas distribution piping because most - if not all - of gas distribution pipeline is close to people all the time; the services go directly to homes, businesses, and offices. For a variety of structural reasons, distribution gas pipeline can't be internally inspected like transmission lines, so an intensive data research effort may be required to perform a risk analysis.

Operators can benefit from an "outsider's" perspective of risk analysis and program development. For example, when transmission clients took a customized approach to plan development and risk analysis, which at times meant using the expertise of third-party consulting firms, they fared much better in their audits than clients who took a "one-size-fits-all" approach.

An industry study co-funded by APGA and the American Gas Association (AGA) found that while corrosion was the biggest threat to gas transmission pipeline, the major risk to gas distribution pipeline is excavation damage. That's one of the reasons that a detailed, complex, one-size-fits-all rule was inappropriate to distribution systems - there are just too many differences between distribution and transmission pipelines.

Know Your Infrastructure

Knowledge of an operator's infrastructure is basic to compliance with DIMP. It makes sense that a program developed for a bare steel system with a history of corrosion leaks will be different from a program for an all-plastic system. Certainly, a good deal of physical and empirical data is regularly collected by most gas distribution operators to help them "know their infrastructure," and DIMP provides framework for evaluating the data. Knowing your system and your infrastructure is more than just knowing its physical components, such as design, size, and material used in construction. It is also knowledge of what's happening in and to the system - leak histories, special field surveys, and information gathered through routine operation and maintenance activity.

Operators may mitigate risk by treating their distribution system as separate segments rather than as a single system, if its parts are significantly different in terms of pressure, materials, age of infrastructure, and maintenance histories. An operator's risk analysis might not necessarily result in replacing pipe. There are other controls that can be put in place to mitigate risk. Through their risk analyses, operators may determine that no additional actions are required. Many operators are already taking steps to address problem areas of their systems, and these actions may be sufficient to address identified threats.

However, the DIMP rules do require operators to be proactive in identifying and managing risk to their systems. For example, in a leak management program, five elements are required, expressed in a appropriate acronym:

Locate the leaks in the distribution system.
Evaluate the action or potential hazards associated with the leak.
Act appropriately to mitigate these hazards.
Keep records.
Self-assess to determine if additional actions are necessary to keep people and property safe.

Measured Improvement

One expected outcome of DIMP is continuous improvement. Operators will have to define some internal performance measures and examine them on a regular basis to see if they're improving the safety of their system. There is flexibility in the determination of what specific internal and external performance measures are appropriate, such as tracking the number of corrosion leaks or tracking the number of third-party hits to measure the effectiveness of damage prevention programs. If operators show, for example, that they are reducing the number of leaks over a given period, an auditor should see that as positive. If the number of leaks is still rising, then the operator will have to take additional effort. According to the DIMP rules, for each significant threat identified to a system, one or more performance measurements must be identified to help the operator determine if they are achieving the desired results.

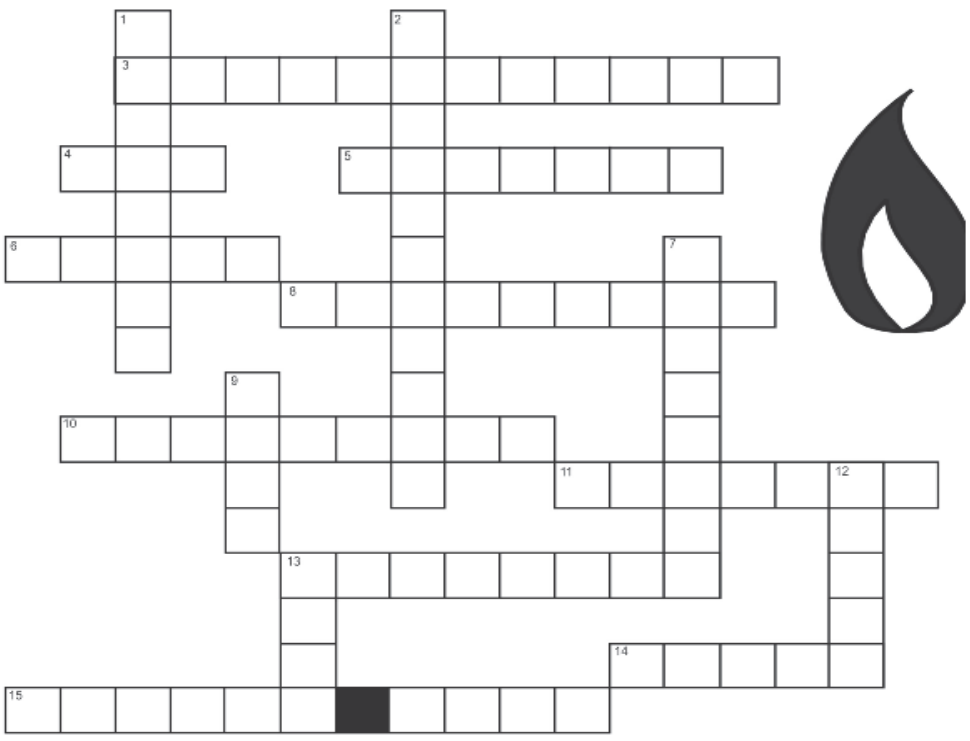
Best Practices

The term "distribution integrity" may be new to the public gas industry, but the concept of risk management programs is not. From leak and corrosion management programs developed in the 1970s to the more recent "call before you dig" and repair/replace programs, best practices have evolved in the gas industry, and some aspects of the DIMP regulations may already be covered by an operator's existing procedures. The difference is the degree of formalization. For example, almost all public gas systems perform some type of leak surveys, pipe surveys, and line patrolling, but these operations may have been performed by different groups in the past with little interaction. That may have to change.

The DIMP regulations give the public gas industry a clearer picture of the steps required by regulators to help ensure continued safety of their gas distribution systems. DIMP brings safety to the forefront and is making the risk management, documentation, and analysis more formal with the possibility of formal repercussions.

Despite being a high-level, flexible regulation, DIMP may still require increased expenditures for compliance. States like Ohio that have taken proactive steps for cost recovery are ahead of other areas anticipating the requirements of DIMP. A number of utilities have partnered with EN Engineering on everything from developing programs to risk analysis to replacing pipe. Each system has its unique needs, but they are all working within their budgets and doing what they can to make their systems safe and more reliable for their customers.

NATURAL GAS CROSSWORD



ACROSS

3. Can't be replenished quickly
4. Energy in natural gas originated here
5. Main ingredient of natural gas
6. Device to measure natural gas usage
8. Strong-smelling additive to natural gas
10. How most natural gas is moved
11. Company that sells natural gas to consumers
13. Form in which energy is stored in natural gas
14. Many ___ use natural gas for heat
15. Remains of ancient plants and animals

DOWN

1. Largest user of natural gas
2. Where natural gas is usually found
7. Producer of renewable methane (organic decay)
9. Most natural gas is burned for _____
12. Number one natural gas producing state
13. Natural gas is sometimes found with this solid fossil fuel

Answers can be found on page 2A